

WE CLAIM:

1. Steering column for a motor vehicle having a steering shaft rotatably mounted in a tubular jacket,

wherein the tubular jacket is secured in use at a vehicle bodywork end on two rails extending substantially in an axial direction, the tubular jacket being guided between the rails in the event of an axial displacement,

wherein at least one rail is provided with at least one deformation element plastically deformable and secured at least at one end on the respective at least one rail, with absorption of energy, in the event of an axial displacement of the tubular jacket in case of a crash in a manner such that the respective at least one deformation element is deformed by rolling friction via deflector structure fixedly disposed on the tubular jacket.

2. Steering column according to Claim 1, wherein the tubular jacket is fixed on the rails via plastic shearing pins.

3. Steering column according to Claim 2, wherein the plastic shearing pins are injection moulded through holes drilled in the rails and the tubular jacket.

4. Steering column according to Claim 2, wherein the plastic shearing pins are releasable from one of the tubular jacket and the

rails under a predetermined force.

5. Steering column according to Claim 3, wherein the plastic shearing pins are releasable from one of the tubular jacket and the rails under a predetermined force.

6. Steering column according to one of Claim 1, wherein the rails are formed with slots extending substantially axially for accommodating longitudinal adjustment of the tubular jacket.

7. Steering column according to one of Claim 2, wherein the rails are formed with slots extending substantially axially for accommodating longitudinal adjustment of the tubular jacket.

8. Steering column according to one of Claim 3, wherein the rails are formed with slots extending substantially axially for accommodating longitudinal adjustment of the tubular jacket.

9. Steering column according to one of Claim 4, wherein the rails are formed with slots extending substantially axially for accommodating longitudinal adjustment of the tubular jacket.

10. Steering column according to Claim 1, wherein the at least one deformation element includes a sheet metal strip.

11. Steering column according to Claim 2, wherein the at least one deformation element includes a sheet metal strip.

12. Steering column according to Claim 3, wherein the at least one deformation element includes a sheet metal strip.

13. Steering column according to Claim 4, wherein the at least one deformation element includes a sheet metal strip.

14. Steering column according to Claim 6, wherein the at least one deformation element includes a sheet metal strip.

15. Steering column according to Claim 1, wherein the deflector structure includes bolts and housing edges on the tubular jacket.

16. Steering column according to Claim 2, wherein the deflector structure includes bolts and housing edges on the tubular jacket.

17. Steering column according to Claim 3, wherein the deflector structure includes bolts and housing edges on the tubular jacket.

18. Steering column according to Claim 4, wherein the

deflector structure includes bolts and housing edges on the tubular jacket.

19. Steering column according to Claim 6, wherein the deflector structure includes bolts and housing edges on the tubular jacket.

20. Steering column according to Claim 10, wherein the deflector structure includes bolts and housing edges on the tubular jacket.

21. Steering column according to Claim 1, wherein at least one of radii and spacing between the deflector structure are variable and selectively settable.

22. Steering column according to Claim 21, wherein the radii and spacing between the deflector structure are set as a function of respective crash conditions.

23. Steering column according to one of Claim 1, wherein guiding of the tubular jacket between the rails provides a forward travel of at least approximately 100 mm in the event of an accident.

24. Steering column according to Claim 1 wherein energy

absorbable by the deformation element can be set by varying the material, material thickness or width of the deformation element , the radii of the deflection means and/or the distance between the deflector structure.

25. Steering column for a motor vehicle comprising:  
a tubular jacket,  
a steering shaft rotatably mounted in the tubular jacket,  
first and second rails extending in an axial direction and secured in use to a vehicle body, said rails guidably supporting the tubular jacket for axial movement between the rails,  
a plastically deformable deformation element connected to the first rail and the tubular jacket and operable to absorb collision forces resulting during relative axial movement of the tubular jacket and the first rail, and  
deflection structure fixed to the tubular jacket and operable to deflect the deformation element with rolling friction during said relative axial movement of the tubular jacket and first rail in response to said collision forces.

26. Steering column according to Claim 25, comprising shear pins fixing the tubular jacket on the rails, said shear pins being operable to release their connection of the tubular jacket and rails in response to predetermined collision forces on the tubular jacket.

27. Steering column according to Claim 26, wherein the plastic shearing pins are releasable from one of the tubular jacket and the rails under a predetermined force.

28. Steering column according to Claim 25, wherein the deformation element is a sheet metal strip.

29. Steering column according to Claim 25, wherein the deflection structure includes a bolt on the tubular jacket.

30. Steering column according to Claim 29, wherein the deflection structure includes a housing edge on the tubular jacket.

31. Steering column according to Claim 30, comprising means for varying the position of the bolt and housing edge.

32. Steering column according to Claim 25, wherein a second plastically deformable deformation element is connected to the second rail and the tubular jacket and operable to absorb collision forces resulted in relative axial movement of the tubular jacket and the second rail, and

wherein second deflection structure is fixed to the tubular jacket and operable to deflect the second deformation element with rolling friction during said relative axial movement of the tubular jacket and second rail in response to said collision force.

33. Steering column according to Claim 32, wherein said first and second deformation element are disposed at respective opposite sides of the tubular jacket.

34. Steering column according to Claim 33, wherein said deflection structure include respective bolts carried by the tubular jacket which in use are partially wrapped by the respective deformation elements.

35. Steering column according to Claim 34, wherein said deflection structure includes respective housing edges on said tubular jacket.